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Original Research

Sphincter-sparing anal-fissure surgery: a 1-year prospective, observational, multicentre study of fissurectomy with anoplasty

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Abstract
Aim: Internal sphincterotomy is the standard surgical treatment for chronic anal fissure, but is frequently complicated by anal incontinence and The study was to evaluate the long-term outcome of anal dilatation for chronic anal fissure, especially possible negative impact on anal sphincter function.
Method: The study was designed as a prospective comparative study. The study was conducted from 1 st January 2021 to 31st march 2022. A total of 584 patients diagnosed with chronic fissure in ano, fulfilling the inclusion and exclusion criteria . 584 patient underwent Sphincter-sparing anal-fissure surgery . Patients were followed up for 2 weeks, 1-6 months to check for any discharge, pain, bleeding, infection, and incontinence(flatus and stool).
Result: 584 patients included in the study, 228 (54.7%) were female and the mean ± SD age was 36.1 ± 8.96 years (ranging from 17 to 73 years). Major complaints of patients; pain, bleeding, constipation, pruritus, perianal discharge.
Recurrence occurred in 15 patients (3.6%) (12 males, three females) and eight patients (1.9%) developed incontinence (four with gas, four with soiling and seven females, one male). The complaints of all patients with gas incontinence and a patient with fluid incontinence regressed, whereas three patients had permanent fluid incontinence.
Conclusions: Sphincter-sparing anal-fissure surgery the gold standard for the treatment of chronic anal fissure when the physicians would like to avoid recurrence and obtain the best pain relief.Given its high rate of healing and low rate of anal incontinence, fissurectomy with anoplasty is a valuable sphincter-sparing surgical treatment for chronic anal fissure.

Introduction

Anal fissure is a longitudinal tear in anoderm under the dentate line which mostly located posteriorly in the midline (90%). It is one of the most common benign diseases of anorectal area. The main presenting symptom is pain during defecation, rectal bleeding, and emotional stress that it causes may reduce people's quality of life.[1] The healing of the chronic anal fissures takes longer than 8–12 weeks and in addition a hypertrophic papilla and a sentinel tubercle accompany the chronic anal fissure and the sphincter muscle fibers at the base of the tear are exposed. [2]

Basically, treatment for anal fissure usually comprises reducing the sphincter pressure with physical or chemical methods. Studies on the methods of treatment of chronic anal fissures range from medical applications to surgery; there is no general agreement on ideal therapy for chronic anal fissures. The American Society of Colon and Rectal Surgeons (ASCRS) guidelines recommend initial nonsurgical management, which includes stool softeners, high fiber diet and warm sitz bath. However, a significant proportion of patients will fail conservative management, therefore further treatment options will be required. Lateral internal sphincterotomy (LIS) is

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attributed to be the gold standard for surgical management of chronic anal fissures when conservative and medical treatment fails. Besides its efficiency, LIS also have some risks of complications. [3]

Hypertonicity of internal anal sphincter has been recognized as a common and classic finding on the digital rectal examination of patients suffering from anal fissure and has been documented by manometry. In spite of being an old problem, the exact mechanism of development of anal fissure and cause-effect relations between the fissure and hypertonic internal sphincter remain uncertain. The history of changes in operative approach to anal fissures has known different strategies of altering this physiologic dysfunction, which are described in classic textbooks of colon and rectal surgery and Standard Practice The finger sphincter stretching, as the first-line recommended surgical procedure in the 1960s, lost its popularity. Lateral internal sphincterotomy became the preferred method in mid-1970s due to its more accurate, measurable, less traumatic, and probably more successful outcome compared to anal dilatation. Since the 1980s, lateral internal sphincterotomy is considered to be the standard operation.[4] Later, this recommendation was emphasized by a statement that "stretch should probably be abandoned in favor of partial internal sphincterotomy until a better operation is described" . It was an absolute disqualification of manual anal dilatation, as risks to continence were clear. It had been estimated that the risk for temporary incontinence reaches 30% and of permanent faecal incontinence up to 10% . It has been confirmed that manual anal stretch had higher rate of incontinence and was not more effective than internal sphincterotomy .[5] Nevertheless, lateral internal sphincterotomy, being claimed for several decades to be the gold standard therapy for chronic anal fissure, has its own wound-related complications including fistula, bleeding, abscess, or non-healing wound in up to 3% of patients . [6] These complications are not known in the practice of anal dilatation . Recently, less traumatic, precise, measurable, and reproducible techniques of anal dilatation were designed and introduced into practice under different names; staged, gradual, and balloon dilation .[7]

For more than 25 years the standard policy of surgical treatment of chronic anal fissure in our colorectal unit has been hydropneumatic balloon anal dilatation that at some point had been replaced with use of dilators (Sohn's dilators) in a standardized fashion and in this way abolishing the well-known high risk of permanent sphincter damage from vigorous finger stretch from the one side and possible septic complications of sphincterotomy from another.[8] Focusing on fecal continence as the main issue of surgical treatment of chronic anal fissure we present herein the long-term follow-up of our patients treated by this method between. An anal fissure is a rupture or lesion in the anal canal's lining below the mucocutaneous junction or dentate line. It is a painful condition that can last for up to two hours during and after defecation. The present literature review is aimed at outlining the clinical signs and symptoms, etiopathogenesis, clinical evaluation, and surgical management of anal fissures with a brief discussion on laser-assisted surgeries.[9] There are varying outcomes based on the type of surgery with respect to healing rates, recurrence, and incontinence. However, the outcomes of surgery may vary from patient to patient. Various studies have shown that lateral internal sphincterotomy is currently considered the most effective surgical treatment for anal fissures. Surgeons may choose to use either the closed or open method for this procedure. Using lasers for sphincterotomy can help to minimize bleeding and postoperative pain.[10]

Study Material and Methods

From the 484 patients who underwent surgery for anal fissure, 100 patients who were under regular follow-up were included in the study. The study was designed as a prospective comparative study. The study was conducted from 1 st January 2021 to 31st march 2022. A total of 584 patients diagnosed with chronic fissure in ano, fulfilling the inclusion and exclusion criteria . 584 patient underwent Sphincter-sparing anal-fissure surgery . Patients were followed up for 2 weeks, 1-6 months to check for any discharge, pain, bleeding, infection, and incontinence(flatus and stool).All patients had prior medical management including a combination of stool softener, laxative, high fiber diet and warm sitz bath.

Inclusion criteria: Patient suffering from anal fissure for more than 6 weeks, exposed fibers of internal sphincter, appearance of sentinel tubercle and hypertrophied anal papilla for supporting the diagnosis of chronic fissure. Patients with simultaneous anal abscesses, anal fistula and/or hemorrhoidal diseases, diagnosis of inflammatory bowel diseases (IBD), who underwent partial LIS (the distal half of the internal sphincter is almost completely cut) and the ones whose medical records were unachievable were excluded from the study. The patients had no history of anal or rectal cancer.Anal pain was assessed before the treatment and at follow-up visits using a linear visual analogue pain .

Results

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Table 1. Clinical profile of study groups.

Clinical features	*n* (%)
Gender	
Female	**228 (54.7)**
Male	**189 (45.3)**
Age (years); mean ± SD	**36.1 ± 8.96**
Complaints	
Pain during defecation	**406 (97.4)**
Rectal bleeding	**325 (77.9)**
History of constipation	**154 (36.9)**
Pruritus	**71 (17)**
Perianal discharge	**14 (3.36)**

Of 584 patients included in the study, 228 (54.7%) were female and the mean ± SD age was 36.1 ± 8.96 years (ranging from 17 to 73 years). In vast majority of the patients, the primary complaints were pain (97.4%) and rectal bleeding (77.9%) during and/or after defecation. Additionally, the other major complaints were constipation, pruritus and perianal discharge.

The patients had been evaluated at first, second, fourth and eighth weeks from the beginning of the treatment for assessing the response to the treatment and the status of complaints (Table 2).

Table 2. Results of pain relief.

Empty Cell	**Number of patients whose complaints relieved (%)**
First week	263 (63.1)
Second week	322 (77.2)
Fourth week	363 (87)
Eighth week	381 (91.4)

The pain relief was obtained in 263 patients (63.1%) in the first week, 322 (77.2%) in the second week, 363 (87%) in the fourth week and 381 (91.4%) in the eighth week. Relief was not observed in 36 patients at the end of the eighth week.

The median duration of the disease was 12 months (ranging from 1 to 34 months). Table 3 shows the outcomes of the procedure with median follow up 1 years.

Complications	***n***	**(%)**
Rectal bleeding	182	(34.1)
Perianal abscess	3	(0.7)
Perianal hematoma	2	(0.5)
Recurrence	15	(3.6)
Female	3	(20)
Male	12	(80)
Sited anteriorly	10	(67)
Sited posteriorly	5	(33)
Incontinence	8	(1.9)
Female	7	(87.5)
Male	1	(12.5)
Patients satisfaction	384	(92.1)
Patients healing	395	(94.7)

There was no decrease in the distribution of early and late complications' rates according to the years.

n the early postoperative period, rectal bleeding was a common problem in 182 patients (34.1%). In addition, three patients had perianal abscess and two patients who used anticoagulants (i.e., clopidogrel or acetylsalicylic acid) had perianal hematoma. These patients relieved after drainage of the abscess and hematoma.

In long-term follow-up, recurrence occurred in 15 patients (3.6%) (12 males, three females) and eight patients (1.9%) developed incontinence (four with gas, four with soiling and seven females, one male). The recurrence rate was higher in anterior fissures (67%). Of the patients with recurrence, nine of them had one and two of them had two prior surgeries. All females with incontinence had prior vaginal deliveries and the male with incontinence had prior anorectal surgery. The complaints of all patients with gas incontinence and a patient with fluid incontinence (male) regressed on the postoperative fourth month, whereas three patients (all females) had permanent fluid incontinence.Patient satisfaction was high

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(92.1%) and the healing was nearly complete (94.7%) at the end of the eighth week.

Discussion

The aim of our study was to determine the efficiency of Sphincter-sparing anal-fissure surgery the complications of the surgery and the factors affecting the complications.Our data supports prior studies in the literature with respect to incontinence and recurrence rates, pain relief, satisfaction and healing of patients.

Notaras described subcutaneous lateral internal sphincterotomy in 1971. The main goal of sphincterotomy is to increase the blood flow of the anoderm by decreasing the maximum anal sphincter pressure by 18–50%. This technique provides an improvement between 82% and 100%.[11]

Araujo et al performed a prospective clinical trial with 190 patients in three groups comparing medical treatment (*n*: 128) vs. LIS (*n*: 62) and reported pain relief rates of 100% for LIS after eighth week (93% in two weeks and 100% at the end of the eighth week). Vaithianathan et al evaluated preoperative and postoperative first, fourth and sixth week pain relief by visual analogue scale (VAS) in 45 patients who underwent LIS. Pain relief was obtained in almost all patients at the end of the sixth week. Although this rate was slightly lower (91.4%) in our study compared to previous two, it was observed that the majority of our cases relieved after eight weeks. This difference may be due to the higher number of patients in our study (*n*: 417).[12,13]

Most of the patients were satisfied in the early stage of treatment after LIS. A study, in which results of Botox and LIS were compared, showed that only 7% of the patients in LIS group were dissatisfied with their treatment. This rate was 1% in a single center study by Salih et alGarcia-Aguilar et al also reported that 80% of patients were very satisfied or satisfied after surgery. In addition, Gupta evaluated the contribution of the removal of hypertrophied anal papillae and fibrous anal polyps to the patient satisfaction. He found out that the patients who had these lesions removed had significantly higher rate of satisfaction, while the others suffered from some residual symptoms such as pain and irritation during defecation, pricking or foreign body sensation in the anus, and pruritus or wetness around the anal verge.[14]

In our study, due to the recurrence, incontinence and/or other early complications, almost 8% of patients were dissatisfied with the outcomes of their LIS surgery. Although we did not have the data for evaluating this condition, we believe that removal of the hypertrophied anal papillae and fibrous anal polyps will increase the patient satisfaction since the most patients' common complaint was palpable hypertrophic papillae after surgery.Fecal incontinence (FI) is the most prominent disadvantage of LIS. In varying severity, up to 47.6% of the patients developed post-operative disturbance of continence after LIS. Furthermore, there are other publications in the literature reporting that partial sphincterotomy is also effective in reducing the risk of incontinence. FI after IS usually occurs mildly (soiling or flatus incontinence) and lasts only for few weeks up to 6 months; even so some authors had reported persistent faecal incontinence for 12 months after surgery. [15]

A novel meta-analysis showed that long-term risk of incontinence after LIS is significant (approximately 15%) with the obvious faecal incontinence rate of 1%.Arroyo et al reported healing rates of 92.5% in patients undergoing LIS surgery. However, the rate of anal incontinence was associated with the procedure was 5%.Nyam et al concluded the healing rate as 96% and some degree of incontinence in 45% of patients after surgery. The study by Menteş and colleagues displayed that very few patients suffered from decline in the quality of life after LIS due to incontinence (1.2% among 244 patients undergoing LIS for IAS). [16]

The potential risk of FI after LIS seems to be variable according to many factors, such as age, anatomic differences between men and women, pregnancy and vaginal delivery, pelvic surgery history, surgical inexperience and inappropriate technique. Besides, complications such as wound infection, hematoma, abscess, anal fistula may develop after LIS. Since we excluded the cases who underwent partial LIS, our results of incontinence and recurrence are based on complete LIS. Gas and/or liquid incontinence were seen in 1.9% of LIS surgery (eight patients) and four patients with gas incontinence resolved without any intervention after eight months, according to our data. However, other three patients had permanent liquid incontinence. All patients who developed permanent incontinence were female and had a history of vaginal delivery. Our most common early stage complication was rectal bleeding, and also three patients developed perianal hematoma and two patients developed perianal abscess. While there was no need of additional intervention for rectal bleeding, hematomas and abscesses had to be drained.

Despite the high success rate in fissure healing after sphincterotomy, recurrence may occur between 1.6% and 6%. The most common cause of recurrence is inadequate sphincterotomy. Also, the localization of the fissure affects the recurrence. The recurrence rate is higher in anterior fissures. In such cases, sphincterotomy can be repeated. In our study, the recurrence rate of LIS group was compatible with the literature (3.6%), and the majority of the recurrent cases were young men with anterior fissures. This can be explained with the strong pelvic muscles of men, resulting with insufficient sphincterotomy.Its retrospective design, being single-centered and not being a randomized controlled study, and the fact that the procedures were performed by different surgeons can be count as the major limitations of this study. In addition, anal canal pressures were unknown since the anal manometer was not performed. A further

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limitation relates to this study is that it does not consist a comparison with other treatment methods.[17] However, despite the fact that it is a single center study, the high number of patients is its greatest advantage. We believe, our results of LIS which we shared objectively will make great contribution to surgeons who are interested in anorectal surgery.

The results of this study support high healing and patient satisfaction rates after LIS. Since the most feared complication of LIS is permanent incontinence, the patient selection should be done carefully in preoperative period, sphincter pressure should be measured and alternative treatments such as Botox should be considered in patients with high incontinence risk. Additionally, the surgeon should make sure that the sphincterotomy is done properly in order to reduce the recurrence rates.

Conclusion

Sphincter-sparing anal-fissure surgery the gold standard for the treatment of chronic anal fissure when the physicians would like to avoid recurrence and obtain the best pain relief.Given its high rate of healing and low rate of anal incontinence, fissurectomy with anoplasty is a valuable sphincter-sparing surgical treatment for chronic anal fissure.

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